

Free fatty acids and β -carotene of artisanal red palm oil in Cameroon

Doris Nanda^a, Germain Kansci^a, Sylvain Rafflegeau^c, Pierre Villeneuve^d, Claude Genot^b

a: University of Yaoundé I, Department of Biochemistry, Yaoundé, Cameroon

b: INRA, UR 1268 Biopolymères Interactions Assemblages, Nantes, France

c: CIRAD, UPR 34 Systèmes de Pérennes, Montpellier, France

d: CIRAD, UMR IATE, Montpellier, France

Abstract

Introduction: African countries of the Guinean gulf among them Cameroon, are traditional red palm oil (RPO) producers and eaters. Nowadays oils and fats consumption per capita is regularly increasing in this countries. In parallel, health problems associated to obesity, type 2 diabetes and A vitamin deficiency are booming. In the southern Cameroon, people are using both industrial and artisanal RPO. The production of the latter, sold on the informal market out of any quality control, is rising thanks to the development of small-scale mills. In such a context, it seemed necessary to assess the chemical and physical quality of artisanal RPO and to relate the recorded quality differences to producing conditions.

This work aims to determine the physicochemical characteristics of RPO to the extraction conditions met with small-scale mills. The impact of factors such as planting material, length/storage time between harvesting and treatment of palm fruits and type of extraction process on the composition and thermal properties of RPO are explored.

Methodology: RPO samples were collected from 32 local artisanal producers after a survey. Artisanal extraction processes were analyzed as regards to RPOs parameters characterizing their nutritional (tocopherols, carotenoids, fatty acid and glyceridic composition, oxidation level) and functional properties (lipolysis level, thermal properties).

Results: Collection of RPO samples: 32 artisanal producers from 4 different production regions were interviewed and tracked. The planting material was identified, the production processes described and 32 samples taken. In 3 producing regions (Center, Littoral and South-West), most of the producers are using continuous small scale mill (Caltech type), manual and motorized ones while in the last region (West) more far away from oil palm development actions, producers are using locally designed motorized water extractors. Oils samples were also collected from a local industrial. **Physicochemical characteristics of the RPOs:** The physicochemical analysis of the RPO samples shows quite homogeneous fatty acid composition and solid and liquid phases with palmitic and oleic fractions representing 15-35% and 85-65% respectively at 25 degree. β -carotene content presented large variations (380-990 ppm) depending on the planting material and/or the region. Free fatty acid (FFA) content depended on the artisanal process. It reached 30% in some samples from Western region. In all samples oxidation markers remained very low while aflatoxins were always below the detection threshold.

Conclusion: The highest variations in RPO samples were found in β -carotene and FFA contents. The artisanal RPOs in Cameroon are very acid with FFA content far superior to edible oil standards. The results evidence that FFA content in RPO from small-scale process reach high levels in some samples is closely related to the time and method of storage of bunches/fruits before the oil extraction.